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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,932	03/16/2004	Katsuhiko Ito	HGM-138-A	2331
21828	7590	03/08/2006	EXAMINER	
CARRIER BLACKMAN AND ASSOCIATES 24101 NOVI ROAD SUITE 100 NOVI, MI 48375			LOPEZ, FRANK D	
			ART UNIT	PAPER NUMBER
			3745	

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/801,932	ITO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	F. Daniel Lopez	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on December 14, 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 14 and 15 is/are allowed.
- 6) ☐ Claim(s) 1,2,5-9 and 11-13 is/are rejected.
- 7) ☐ Claim(s) 3, 4, 10, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

***Response to Amendment***

Applicant's arguments filed December 14, 2005, have been fully considered but they are not deemed to be persuasive.

Applicant's arguments with respect to claims 1, 2, 5-9 and 11-13 have been considered but are deemed to be moot in view of the new grounds of rejection.

Applicant argues that although the lever (113) and potentiometer shaft (112) of Hayashi et al is a rotation connection mechanism, it does not show the lever as one end coaxial with the rolling axis. Applicant is mistaken. Lever 113 has 2 axes. Since it is a slender elongated pin, there is an axis passing through its center, parallel to the shaft 74. But lever also rotates about the potentiometer shaft and therefore has a rotation axis. This rotation axis is coaxial with the rolling axis of the swash plate.

Applicant argues that the lever (113) of Hayashi et al is fitted within the grove (114), implying that the lever and groove fit together with "no play", thereby not permitting any axial misalignment; and that if the potentiometer shaft is inclined at an angle to the rolling axis, the lever, fixed at a right angle to the potentiometer shaft, would lie at an angle to the groove and would no longer be received in the groove. Applicant is mistaken. A definition of "fit" is "to insert, as into a receptacle" (Webster's New World Dictionary, Second college Edition © 1970), which does not imply with or without play. One having ordinary skill in the hydrostatic art would expect that the lever would not have a force fit into the groove, because the assembly would be difficult, but that there would not be excessive play between the lever aNd the groove, because the sensor would be inaccurate.

The potentiometer shaft can be at an angle with the rolling axis of the swash plate in either a first plane containing the potentiometer shaft, perpendicular to the output shaft (31), or a second plane containing the potentiometer shaft, parallel to the output shaft. If the misalignment is in the first plane, the lever would slide in the groove, parallel to the output shaft, closer to or farther away from an end of the groove, while still accurately following the movement of the swash plate. If the misalignment is in the second plane, the lever would be at an angle to the output shaft, but stay in the groove,

to accurately follow the movement of the swash plate. It is understood that any misalignment would be small and would not cause the lever to bind in the groove. Therefore, the rotation connection mechanism of Hayashi et al accurately transmits the movement of the swash plate, when potentiometer shaft can be at an angle with the rolling axis of the swash plate; and therefore meets the limitations of claim1.

Applicant states that a determination of obviousness is a legal matter, dependent on four factual inquiries, including the level of ordinary skill in the art. The art dealt with by applicant's invention is a hydrostatic transmission for a motorcycle. A person of ordinary skill in this art is an engineer, who has an extensive background in both mechanical and fluid structures. This person would understand how to mate an internal combustion engine to the hydrostatic transmission, how to mate a control system (both electrical and mechanical) to the hydrostatic transmission, how to mate the hydrostatic transmission to an output shaft through gearing and how to minimize the size and weight of the resulting system; in addition to understanding the workings of a hydrostatic transmission. In any discussion of what the prior art teachings mean, we must necessarily look at what the teaching means to this engineer.

Applicant argues that the teaching of Orlando et al is to provide a coupling between a first shaft attached to a helical screw rotary compressor and a second shaft of an angle detector; and that there is no motivation to apply a teaching from a rotary compressor to a motorcycle transmission. Applicant further argues that in order to rely on a reference, it must be either in the applicant's field of endeavor, or, if not, then be reasonably pertinent to the particular problem with which the inventor is concerned. Since the two cited references (Japan 2001-343,060 and Orlando et al) are from completely disparate fields, it would not have been obvious to combine them.

Orlando et al solves a number of problems with his invention. Orlando et al can be considered as being related to problems with helical screw rotary compressors, although the helical screw rotary compressor is essentially a black box (10 of fig 1), with no details shown. It can also be considered as being related to problems with a position sensor for

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a piston (24, fig 3). It can also be considered as being related to problems with coupling a rotary sensor (36) to a rotating shaft (146). One of ordinary skill in the hydrostatic transmission art would recognize that the problem with coupling a rotary sensor to a rotating shaft exists in sensing the position of the rotating swash plate, since the swash plate of Japan 2001-343,060 also has a rotating shaft; and therefore would find the teaching of Orlando et al pertinent to the system of Japan 2001-343,060. Also, the teaching of Orlando et al has to do with sensing a position of a rotating shaft, and so is pertinent to the particular problem with which the inventor is concerned. For both of these reasons, it would have been obvious to combine Orlando et al with Japan 2001-343,060.

Applicant argues that Japan 2001-343,060 shows a single rigid shaft connected to the swash plate; that Orlando et al teaches coupling a first shaft to a second shaft using a friction fit flexible tube; that Orlando et al does not teach coupling a shaft to a plate; and that there is no teaching of modifying a single shaft of Japan 2001-343,060 into two separate shaft and providing a coupling therebetween.

One of ordinary skill in the hydrostatic transmission art would recognize that the position sensor is probably an off the shelf position sensor (for economic reasons), and would recognize that off the shelf position sensors can have a variety of connections, to connect to a rotary shaft, including another shaft. Japan 2001-343,060 actually shows a shaft connected to a plate and a position sensor, but not in enough detail as to whether there is one or more shafts (I.E. how the shaft is connected to the position sensor).

Orlando et al teaches that there is a problem of slight misalignment when aligning a rotary position sensor to be coaxial with a rotating shaft. The solution of Orlando et al is to provide two shafts, with a coupling (flexible tube) in-between to allow for the slight misalignment. One of ordinary skill in the hydrostatic transmission art is sophisticated enough to recognize, if Japan 2001-343,060 teaches only one shaft between the swash plate and the position sensor, that it could be replaced by two shafts and an intermediate coupling, as taught by Orlando et al, to allow slight misalignment. Furthermore, Orlando et al does not have to teach that the shaft can be mounted to a

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plate, since one of ordinary skill in the hydrostatic transmission art would recognize how to do this from Japan 2001-343,060.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

Claims 1 and 5-7 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hayashi et al. The angle detector (111, e.g. fig 3) is connected to the rolling member (22) by a shaft (113) in a groove (114), which allows some axial misalignment.

***Claim Rejections - 35 USC § 103***

Claims 1, 2, 5-9 and 11-13 are rejected under 35 U.S.C. § 103 as being unpatentable over Japan 2001-343,060 in view of Orlando et al. Japan 2001-343,060 discloses a swash plate hydraulic unit comprising a plurality of plungers slidably disposed in respective plunger holes of a rotatable cylinder; a swash plate (86), rotatably supported by a casing, with a rolling axis perpendicular to the axis of rotation of the cylinder, contacting an end of the plungers and connected to one end of a rotation connection mechanism (e.g. 121), by a rolling member (83) connected to the swash plate; a swash plate tilting angle detector (121, 212) having an angle detector mounted to the casing, coaxial to the rolling axis, and connected to another end of the rotation connection mechanism; but does not disclose that the rotation connection mechanism transmits the tilting of the swash plate to the angle detector, even when the portion of the angle detector connected to the rotation connection mechanism is inclined at an angle to the tilt axis; wherein the rotation connection mechanism include first and second connection rods connected to the swash plate and angle detector, respectively, with a movable joint connecting the first and second connecting rods together.

Orlando et al teaches, for a rotation connection mechanism (212) having one end connected to a first element, whose angle is measured, and another end connected to an angle detector (36) mounted to a casing (e.g. 204) coaxially to the first element; that

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the rotation connection mechanism includes first (146) and second (214) connection rods fixed to the first element and the angle detector, respectively, with a movable joint (212) connecting the first and second connecting rods together; for the purpose of allowing slight axial misalignment between the angle detector and first element (column 7 line 12-17).

Since Japan 2001-343,060 discloses a rotation connection mechanism between an angle detector and a coaxial rolling mechanism, and since Orlando et al teaches a need for a rotation connection mechanism which allows minor axial misalignment; it would have been obvious at the time the invention was made to one having ordinary skill in the art to make the rotation connection mechanism of Japan 2001-343,060 include first and second connection rods fixed to the swash plate and angle detector of Japan 2001-343,060, respectively, with a movable joint connecting the first and second connecting rods together, as taught by Orlando et al, for the purpose of allowing slight axial misalignment between the angle detector and rolling mechanism.

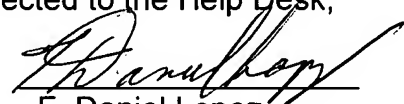
### ***Conclusion***

Claims 14 and 15 are allowed.

Claims 3, 4, 10, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571- 272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is 571-273-8300. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.

  
F. Daniel Lopez  
Primary Examiner  
Art Unit 3745  
March 6, 2006